Substance name: Cobalt dichloride
EC number: 231-589-4
CAS number: 7646-79-9

PRIORITISATION AND ANNEX XIV BACKGROUND INFORMATION

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Disclaimer:

The present document has been developed by ECHA mainly based on the technical report "Data on Manufacture, Import, Export, Uses and Releases of cobalt dichloride as well as Information on Potential Alternatives to its Use"; prepared by Entec, supported by BRE and IOM under framework contract ECHA/2008/2 (specific contract ECHA/2008/02/SR5/ECA.227). The "Proposal for identification of cobalt dichloride as a SVHC (Annex XV report prepared by France 2008) served as secondary source.

Note that the information on alternatives is not intended to be an exhaustive analysis, but is only included in order to support the transitional arrangements and in particular the proposed application dates for substances proposed to be included in Annex XIV.

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PRIORITISATION AND ANNEX XIV BACKGROUND INFORMATION

1 Prioritisation

The volume of cobalt dichloride supplied to non-intermediate uses is relatively low. The uses covered by a potential authorisation requirement are electroplating and humidity indicators. Whereas the use in humidity indicators is not considered wide dispersive, no conclusion on the nature of the release pattern of electroplating can be drawn without supplementary information.

Nevertheless, the regulatory effectiveness of subjecting the use of the dichloride salt alone to the authorisation requirement can be considered questionable because it might in many cases be easy to bypass the authorisation requirement by replacing the dichloride salt by another cobalt compound with a similar hazard potential.

Therefore, it is proposed to not prioritise cobalt dichloride for inclusion in Annex XIV.

2 Identity of the substance

Chemical name:	Cobalt dichloride
EC Number:	231-589-4
CAS Number:	7646-79-9
IUPAC Name:	Cobalt(2+) dichloride

3 Intrinsic properties

The substance has been identified as a Substance of Very High Concern according to **Article 57(a) as it is classified as carcinogenic cat. 2** as reported in the support document on cobalt dichloride and following the agreement of the MSC adopted on the 1st of October 2008.

4 Volumes

According to consultation with industry the European manufacturing of cobalt dichloride was **10,000 t** in 2007. Both import and export reached 60 t in 2006 (Entec 2008).

5 Characterisation of uses and releases

5.1 Uses

The main use of cobalt dichloride is as an intermediate, accounting to 99% of all uses in the EU according to information provided by the Cobalt Development Institute (CDI) (Entec 2008).

Of the 10,000 t/y of cobalt dichloride supplied, 88% is used as intermediate in the synthesis of other inorganic cobalt compounds (e.g. cobalt dihydroxide, cobalt

oxalate). For the majority of these uses (approximately 95%), the cobalt dichloride is used as an on-site isolated intermediate. Another 10% of cobalt dichloride is used as an intermediate in the synthesis of organic cobalt compounds (cobalt carboxylates) either by the manufacturer or by downstream users. Again, cobalt dichloride is either used as an on-site isolated intermediate or as a transported isolated intermediate. Further intermediate uses are the synthesis of vitamin B12 (<1%, i.e. <100 t/y) as well as the synthesis of pigments. (Entec 2008)

As regards non-intermediate uses, small tonnages may be used for electroplating, animal food and veterinary products[1]. No indicative figures for quantifying theses small uses are available, however, including the synthesis of pigments, these small uses might represent less than 1 % (i.e. <100 t/y) of the total use (Entec 2008).

Further non-intermediate use of $CoCl_2$ takes place in humidity indicators used for military purposes[2] and in standard solutions to determine colour in liquids[3]. The total volume of $CoCl_2$ in both of these non-intermediate uses is << 1 t/y (Entec 2008, more specific information in the confidential Annex of the cited report).

Research is been carried out for use of cobalt salts (and in particular cobalt dichloride) in electrodeposition processes in the aerospace and automotive sectors (Entec 2008). This research aims at reducing Cr (VI) electroplating by promoting use of cobalt salts. Tonnages used at present in electroplating are not known. However, depending on the outcome of the research, the use of $CoCl_2$ in electrodeposition processes could be an emerging use.

An overview of the uses is given in Table 1.

Table 1: Uses of $CoCl_2$ in EU and downstream uses (Entec 2008)

Use	Tonnage (t)	Downstream activities	Potential exemptions
Synthesis of inorganic Co compounds	8,800	Cutting tools *	On-site or transported isolated intermediates
Synthesis of organic Co compounds	1,000	Adhesive for tyres, drying agents in paints *	On-site or transported isolated intermediates
Synthesis of vitamin B12	<100	Vitamin B12 *	On-site or transported isolated intermediates Use in medicinal products

[1] Uses in veterinary products and animal food might be exempted from the authorisation requirement in accordance with Articles 2(5(a)) and 2(5(b)).

[2] It should be noted that the use of cobalt dichloride in humidity indicator cards for military purposes may be exempted from REACH by the Member States in accordance with Article 2(3).

[3] The use of cobalt dichloride in standard solutions to determine colour in liquids can be considered falling under research and development and hence may be exempted from authorisation according to Article 56(3). In addition, the concentration of $CoCl_2$ in these solutions is < 0.01 %, which is below the lowest concentration limit specified in Annex I of Directive 67/548/EEC resulting in the classification of the preparation as dangerous. Consequently, this use may be exempted from authorisation according to Article 56(5b).

Manufacture of pigments	Small #	Textiles *	Use as intermediate for pigment synthesis
Production of veterinary products	Small #	*	Veterinary use
Production of animal food	Small #	*	Use in food or feedstuffs
Electroplating	Small #	*	
Humidity indicator cards	Confidential ##	Export packaging, electronic, military	Military exemptions
Colour standard solutions	Confidential ##	Liquid purity testing	Use in scientific research and development Low concentration

* for these activities, cobalt dichloride is not expected to be present in the final product.

the total tonnage supplied to all these uses together is presumably less than 100 t/y.

the total tonnage supplied to these two uses is << 1 t/y.

5.2 Releases

No information on releases from non-intermediate uses to the environment is available.

Similarly, no information regarding number of workers involved and releases to the working environment is available.

The UK Workplace exposure limit for cobalt and cobalt compounds is 0.1 mg/m^3 and the American Conference for Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV) is 0.02 mg/m^3. Although the TLV has no legal status, it would generally be regarded as good practice to meet the TLV. UK Workplace exposure limits are normally set at levels that are believed to be achievable through good occupational hygiene practice.

Overall, it seems likely that workplace exposures to cobalt dichloride are generally low. It is technically feasible to control airborne exposure concentrations to less than 0.1 mg/m^3 and concentrations in a large proportion of workplaces handling cobalt dichloride are likely to be less than 0.02 mg/m^3. Dermal exposure to cobalt dichloride can be readily controlled through the use of appropriately designed handling systems and procedures and the use of protective clothing and gloves where appropriate (Entec 2008).

5.3 Geographical distribution

The manufacture of cobalt dichloride in the EU takes place at five sites in France, Belgium, Finland and the United Kingdom.

There is no information on geographical distribution of the sites where non-intermediate uses not exempted from a potential authorisation requirement take place. However, since these are specialised uses and since only low tonnages are involved, it can be assumed that non-intermediate use takes place at few sites.

5.4 Conclusions on wide dispersiveness of uses

More than 99% of the substance is thought to be used as intermediate in the synthesis of other cobalt compounds (including vitamin B12).

Non-intermediate use of $CoCl_2$ (in total <100 t/y, including use for synthesis of pigments, which is an intermediate use) takes place in humidity indicators and as agent to determine colours in liquids. Furthermore, the substance may be used in electroplating, to add cobalt as trace element to food and feedstuffs, and for veterinary medicinal products. Except of the uses for electroplating and humidity indicators, these uses are exempted from the authorisation requirement (Articles 2(5(a)), 2(5(b)) and 56(3)). As the cobalt dichloride based humidity indicators are used in the military sector, this use may as well be exempted by Member States in the interest of defence (Article 2(3)).

No consumer use has been identified for the substance. The uses covered by a potential authorisation requirement (electroplating and humidity indicators, if the latter use will not be exempted from REACH by the Member States) are specialised ones and therefore might take place at a limited (but unknown) number of sites. Because the tonnage used for the humidity indicators is very low and only a limited number of trained persons will come into contact (if at all) with these indicator cards, this use is not considered wide dispersive. As regards electroplating, no conclusion on the nature of this use can be drawn without supplementary information about releases and more precise information on the tonnage supplied to this use.

6 Complexity of the supply chain

Based on available information, uses of cobalt dichloride that would not be exempted from authorisation take place only in professional environments at a limited but unknown number of sites, with presumably small numbers of actors involved.

The actors of the supply chain affected by an authorisation requirement could be:

- up to 4 manufacturers at 5 manufacturing sites,
- unknown, but presumably limited number of importers (imported volumes are very small compared to EU manufacture),
- an unknown, but presumably limited number of specialised metal surface treatment facilities,
- an unknown, but presumably higher number of end users of the surface treated articles
- an unknown but presumably very limited number of manufacturers of humidity indicator cards
- military as end-user of the humidity indicator cards.

The supply chains related to the uses of cobalt dichloride that would be relevant for authorisation seem to be fairly short, not very complicated and associated with a relatively limited number of downstream users.

7 Alternatives

Consultation with industry (Entec 2008) regarding alternatives for use of $CoCl_2$ as humidity indicator showed that alternatives to cobalt dichloride (e.g. other metal salts, such as iron or copper salts, as proposed by France in their Annex XV dossier) did not allow the same range of humidity indication and therefore these substances were not considered to be technically suitable.

According to industry, the only alternative substance identified so far allowing humidity indicator cards to fulfil all quality and performance requirements specified in military and industrial standards is cobalt bromide, which probably has a similar hazard profile to cobalt dichloride.

No alternative substances or techniques to cobalt dichloride have been identified for the other uses (Entec 2008).

8 Existing Community legislation relevant for possible exemptions

No information available.

9 Other information

No other information available.

10 References

Annex XV Dossier (2008). Cobalt dichloride. Proposal for identification of a substance as a CMR Cat 1 or 2, PBT, vPvB or a substance of an equivalent level of concern. Submitted by France, 2.06.2008.

Entec (2008). Data on manufacture, import, export, uses and releases of cobalt dichloride as well as information on potential alternatives to its use. Contract ECHA/2008/02/SR5/ECA.227).